



SOCIAL DISTRUST AND UNBENDING TRENDS ON ENERGY POLICIES: A BRAZILIAN VIEWPOINT

Fernando Pedrão

Instituto de Pesquisas Sociais
fcpedrao@terra.com.br

ABSTRACT

The major trends in international politics attribute an enlarged role to energy in the options of industrialized countries and regulate the prospects of development for many others. The emergence of new economic powers brings additional references to national policies for energy planning. It is sure to say that Civil Society became aware of the importance of energy in the last three decades with the help of the media. Reading on energy policies shows a complex woven of interests that put a distance between informed or controlled society. Changes in the global scene must be appraised as unavoidable influences on national policies. The last decades made clear for all the strategic meaning of energy. To open discussion on the essentials of the problem became a necessary step to reach a meaningful energy policy.

Keywords: Energy laws; Social framework; Energy production; Consumption.

1 FOREWORDS

The whole feud over energy boils down to policies adequate to face growing demand pressures and restrictions of supply. Those may be sketched at global terms or established to each country, given connections between the global and the local. To every country energy became an internal affair with international inter-actions. The energy issue today blends global and local problems. To every country energy became an internal affair with international connections. The energy issue today blends global and local problems crisscrossed by political goals and economic means, under the dominance of the oil production system though not restricted to that source and facing increasing concern about nuclear power. One achieved a remarkable technical development on several areas of production, the political core of the policies became evident as well as its scientific foundation. The distance between the immediate technical definitions and the scientific approach shows when the long-term projections are seen.

The global picture underwent severe changes in oil production regulated by political tensions and an enlargement of the interests of the bigger nations all over the world especially in Africa. In the Americas Brazil upsurges as a new oil power nation however entangled with a profile of raw materials export model. Retreat from nuclear of some of the greater energy consumers, beginning with Japan, stress the importance of oil to sustain advanced economies in spite of environmental focus on alternative sources. It is clear that the incident in Fukushima triggered a change in energy policies that now drift away from the neoliberal standards.

In this picture sectoral analysis becomes meaningless when the main disturbing facts comes from what Nye calls the privatization of war (2012) and we call a delusion of power. The Europeans defends the Versailles Treaty of 1919 and the North Americans insist in the equivalent of 1945. In fact Western powers have not won a single war

since Korea that was a stalemate. Economic analysis lagged the chaos left by colonial remains, generating irrational military abuse like bombing Serbia and Libya. Widespread conflicts undertaken by religious and other non-government organizations trigger repression wars like those in Afghanistan and Iraq with the involvement of the international contradictory power of NATO, anyhow marking the international scene. The global picture encompasses a struggle for energy control and defensive arrangements of market¹ either promoted by the big powers or by ascending economies. The mercurial expansion of Chinese interests in Africa helped Angola, Nigeria and Mozambique to overcome years of despair war and to emerge as growing economies. The energy issue underlies the international agreements among nations competing for sources and routes of energy.

For Brazil the contradictions are less important than the advantages of energy industry partly because of its vast hydro resources, for its newly found reserves of oil and its opportunities for solar energy. The big and engrossing ethanol production contributes heavily to create additional options for renewable energy in spite of its unquestionable impact on environment. The energy equation focus on hydropower but has open options on oil, gas and ethanol. However, there is a final effort to be made before the new advantages can be accounted for.

This new century starts with Brazil in a much comfortable position as compared with its situation in the 70's but two decisive questions namely the impossibility to meet its needed goals in the same pattern of production prevailing up to now and the challenge to overcome technology requirements. Thinking on energy planning cannot be led by the same restricted caucus and demands open-minded debate. The poorly disguised speech of ethanol monopoly tends to be superated by the search of more flexible technology pushed by the entrance of new companies².

The importance of energy today is evident to most people but not necessarily in its global meaning and in its historical weight. The core options on energy production, consumption and planning have been somehow obfuscated by short-term dilemmas and by the prevalence of big interests. To admit that energy production must comply with environmental constraints amounts to say that the capitalist system have to change to survive (ALTVATER, 2010). National governments and big companies coalesce in a market divided between the exploitation of the major energy sources and a wide range of investments on technology and control of research. The approach to energy knowledge became an essential background to an actualized thinking on geopolitics.

Major adjustments in the appraisal of energy property – equivalent to land tenure - might account for improving in policies but without changing the core assumptions. If it is true that the uses of energy consistently overpass production projections it is also true that most countries recognized the need for energy planning. There is a socially necessary planning (PEDRÃO, 2004) that accounts for the elimination of unnecessary errors and risks without becoming dull and repetitious. Planning in any case entails a long-run view adjusted by short-run variations.

The energy issue is far more complex than the feud with neoliberals who in fact continued to plan energy under other names. In this essay I shall deal with the contradictions between middle class mistrust on energy policies

¹ Information just released by press points to an Asian market agreement by China, Japan and South Korea holding a sizeable part of world market.

² This later might be the Latin-American market in which poor surplus countries like Bolivia gain bargain positions with capital exporting countries like Chile. Traditional oil producers like Trinidad lose influence while Brazil emerges as an energy power. An additional issue shall be taken into account in the distinction between those connected to the supplying system to the U.S. and the others playing on open market. Last but not least the China hold on mineral resources in countries with an upper hand in African countries.

and the unbending trend of industrial society to use more energy. Social goals of improving the consumption of the majority have little coincidence with the plans of big companies, who always try to minimize risks but intent to invest in dangerous projects on sources like carbon and nuclear. The governments try to convince society of the need for nuclear power disguising its risks and the unavoidable long lasting costs of that source³. Nuclear power can be not necessary for providing electric power but it is impossible to ignore its strategic weight. That might be a crucial aspect of the pending scarcity of energy for the production system but do not express the real global pressure over energy means for living conditions. What then would be the social costs to sustain an expanding supply of energy to meet society requests? The answer to this question is undoubtedly a matter of political power.

This new century starts with Brazil in a much comfortable position as compared with its situation up to the 70's but still facing two decisive questions, namely the impossibility to meet its needed goals in the same pattern of production prevailing up to now and the challenge to overcome technology requirements. Advanced capitalist production moves through economies technology intensives thus pressing the less industrialized countries to switch from their traditional production pattern to new sectors closer to technology renewal. In many countries this movement is impaired by insufficient response from the education system and from lack of compromise from private enterprise to invest in technology. The easy way is to associate with foreign companies representing the technological expertise. This pattern clearly conflicts with the need to independence. With the possible exception of hydroelectric power, Brazil still braces with foreign technology in eolic, nuclear and so on. In this picture comes the simple but lethal question that the system cannot expand in the same lines it did in the past. Changing from one pattern to another implies on deciding which new pattern. Which transition towards which profile? Shall we insist on hydroelectric power? What should be he role of solar energy? What are the real benefits of eolic energy besides the business it attracted?

Transitions in the energy production system are mandatory and require an overwhelming effort to activate slow moving sectors. The concept of technology upgrading comes up as a strategic approach geared to deal with the variety of situations in the various energy fields. Thinking on energy planning cannot deal by the same restricted caucus and the challenges posed by the sector demand open-minded debate. A national viewpoint on the energy issue must be processed by society on distinctive not to be mistaken with the private approach (TOLMASQUIN, 2011).

The importance of energy today is evident to most people but not necessarily in its whole social meaning and on its historical weight. The core options on energy production, consumption and planning have been somehow obfuscated by short-term dilemmas and by the prevalence of big interests. The essential interactions between production and consumption are not contemplated when private interests compete for specific slices of national markets. National governments and big companies coalesce in a market divided between the exploitation of the major energy sources and a wide range of investing on technology and control of research. The approach to energy knowledge became an essential background to an actualized thinking on geopolitics.

Major adjustments in appraisal might account for improving in policies but without the needed weight to change the core assumptions. Institutional and administrative features of those policies have to be accounted for as

³ While Germany pulls out of industrial use of nuclear power France maintain its nuclear program hiding the many incidents it incurred up to now. Japan all out retreat from nuclear means an enormous cost that most Europeans are not in position to take.

they may hamper the economic and the technical aspects. If it is true that the uses of energy consistently overpass production projections it is also true that many countries recognized the need for energy planning and work on long-term view. There is a socially necessary planning (PEDRÃO, 2004) that accounts for the elimination of unnecessary errors and risks without becoming dull and repetitious. Planning in any case entails long-run view and a keen sense of the connections among undertakings spread over different intervals of time.

Social tensions induced by the great conflict over the control of energy sources and fuel occupies the center of international politics on some open scenes and on covert disputes. The division between oil and alternative sources covers the difference among conditions to lead on technology change. Changes in production profile are imperative (SLIM, 2009) and constitute an underground of declared renewal of energy sector in Brazil (TOLMASQUIN, 2010). There comes the pressure exerted by the nations biggest consumers and the nations with the greater endowments of energy sources, with the interference of financial and military arguments. The limits to the use of sheer military pressure are equal to de sense of global risk, typical of to-days politics. Some very practical issues unfold under superficial pragmatism calling for Political thinking.

Behind the politician's speeches, shared by self-entitled specialized media, there are some major references to deal with. Common sense politics suggests selecting key questions from energy field to reflect on development policies. We shall point out three of those issues, one on the conditions for growth of energy production and the others on the ties between social and technical sides on the energy matter of fact planning. There, prior to any other qualifications, it shall be understood that planning encompasses State and private decisions, on various forms of co-operation, thus assuming the exquisite combinations of interests in nowadays policies. It then will come as no surprise that the majority of educated society, not only the privileged, come to distrust the official speech, weather it comes from Europeans or North-Americans, reading their lips as favoring industrial interests.

Finally, one cannot conclude this overture without mentioning the global changes on energy appraisal due to the increase in oil reserves and the recent shock on nuclear energy after the Fukushima accident. The whole philosophy of energy policy, since the UN conference of 1960 has been directed to look for more potential and for the technology identified with the big production. Since then a great number of opportunities appeared for the development of small production, either on conventional sources or in new ones. The development of eolic energy and of solar energy may play a significant role in the near future and investment in small devices in general can be of great help when the issue is to control energy consumption in big cities.

2 THE CORE ISSUES

The core question about energy planning concerns the gap between production and consumption when production may be forecasted with little error while consumption may surprise with unexpected jumps. The production system may be planned to invest to cover projected consumption but everybody knows that consumption usually overpass the projected production capacity. The gap may traced from the market explosion after the Second World War gaining speed since the 60's, widening the scope of middle class consumption from the 80's, but turning back since the beginning of the new century in a crisis hard to pin down. The multi-centered and elusive crisis shortened the prospects for European economies and kept North

America in a low profile nursing a little growth and a resilient unemployment.

Since the crisis of capital accumulation pattern on the 1960's the business world came to reckon on the centrality of energy production and consumption behind the needed push on high technologies industries. The energy coefficient in final products must be controlled but its costs shall be compared with the energy needed to reduce that factor. The final saving may differ from the initial data. It is true that it is not possible to produce without energy but an effort must be made to diminish the energy input in every final product. Those are the determinations of modern world enhanced in the richest societies with their dependence on resources of other countries. The new crisis started by 2008, this time engulfing the richer countries, showed a major weakness of the international economy bound by financial interests. The American economy accumulated substantial losses of competitiveness as compared with the so-called Asian tigers in sectors like the automotive industry, but the swiftness with the industry moved from one country to another is always linked to energy supply and the prices of labor. From there is one step to conclude that the main point is the price of energy.

At nowadays point some consumption pattern should be assumed as inevitable and the leading economies would have their needs secured. But that was also the moment to display the complexity of alternative sources as seen in the U.N. conference of 1961. Worldly consumption pattern maintain certain steady features with a majority of countries with growing deficits. Few countries like Brazil change their position from deficit to superavit but several regions, mostly not industrialized, became sellers of oil. Lately the international market for oil production is clearly dominated by initiatives from the national governments and not only through the use of militar force⁴.

In such context it is necessary to point to the essential even when it is not a highlight. The efforts made by the great theoreticians in contemporary Physics. Some achievements on science define a turning point in the relationship between science and technology (STENGERS, 2002) reaching to the very core of scientific reasoning (GEYMONAT; GIORELLO, 1986) and eroding a presumed practical view of technology. It is now imperative to think on energy in the same frame through with science pathways. Planning energy means planning education.

Much of this surge of science may be seen in Prigogine with his trio⁵ that presents two main principles now essential to energy planning that are the frictional universe and the expanding structures. Those are principles that result in an irreversible universe subject to energy loss, that is, ruled by entropy. Is the world of uncertainty, in which the changes in scale always equal some changes in structure. That describes a universe of resources bound by composition and submitted to a general law of irreversibility, moved by entropy. That comes to the social world projecting new values for available resources. Availability then will not be only matter of costs but entrails all the consequences of the composition changes. Who could effectively abandon carbon in winter?

Common sense politics suggests selecting some key questions on the energy field to reflect present development problems. We shall point out to three of those issues, one on the conditions for growth of energy production and the others on the ties between social and technical sides of energy matter of fact planning. There, prior to any other qualifications, it must be established that effective planning summarizes State and private decisions, thus assuming the exquisite combinations of interests in nowadays policies. Planning means an articulated

⁴ Some European companies, especially the French, operate backed by their governments but the most spectacular expansion is that of the China to day present in every continent.

⁵ Ilya Prigogine's, *A nova aliança* (1997), *Entre o tempo e a eternidade* (1992), *O fim das certezas* (1996), the first two in co-operation with Isabelle Stengers.

action towards national objectives and is not acting on public sector margin only.

First of all, energy consumption should not be blamed for hampering capitalist society once growing consumption has been functional to modern society and shortage of energy cannot be appraised as independent from major options for industrial paths of capital formation. Present day industrial structure comprehends a limited number of options for new investments that are to be evaluated by the companies holding the financial means to take them, so that industrial decisions work within the scope of feasible investments. Much of conventional energy analysis tripped over the role of consumption simply by neglecting the composition factor on energy consumption. Let us simply mention that household consumption is less than 5% in Brazil compared with industrial uses. We shall distinguish spontaneous and induced consumption when a growing part of the latter responds to the influence of publicity and marketing in general. Leading industries depends more and more on the induced demand as it is the case of automotive industries. Induced demand means an additional pressure on the financial system and on the debt coefficient in the economy as a whole. The core question is that the companies must decide on amounts of investment sufficient to guarantee the reproduction of their capital, selected from a limited list of the technically feasible. The operation that dissolved the complexity consumption composition into macroeconomic aggregates simply wrests out the social significance of the issue. Who tends to benefit from the efforts to provide energy? The latter development of world economy shows the inadequacy of these procedures. It is not acceptable to assume industrialization as one same process since early XX century. The overall use of energy increased and not only because of the rise of China as a major economy but because the industrial countries also expanded their uses of energy as an item of comfort.

The emergence of new industrial countries with big population and undergoing very fast urbanization, like China and India, nullify any simplification of the weight of expanded consumption on energy means⁶. Consumption dynamics responds to some cultural appeal also far away from the established patterns of the first industrial society⁷. What are the justifications for increasing sumptuary consumption? Questioning development as a movement geared to eliminate poverty shall be a means to separate the goals of the rich from those of the poor.

That all shows the need for Political Economy of Energy able to look into connections between the social costs of expansion and the inertial costs caused by entropy (PEDRÃO, 1998). Much of conventional energy analysis tripped over the role of consumption simply by neglecting the composition factor on energy consumption. Let us simply mention that household consumption in Brazil is less than 5% of industrial uses. To dilute composition into macroeconomic aggregates simply wrests out the significance of the issue. Who tends to benefit from the efforts to provide energy? The latter development of world economy made evident the inadequacy of these procedures. It is not acceptable to presume industrialization as one same process since early XX century. The overall use of energy increased not only because of China but also by India, Brazil, Turkey and many others defining a general trend of increasing use of energy.

The emergence of new industrial countries with big population and undergoing very fast urbanization like China and India nullify any simplification of the weight of expanded consumption on energy systems. The dynamics

⁶ It shall also include México City with some 20 million people and São Paulo around 11 million.

⁷ We shall distinguish uses of energy referring to the energy component in production and consumption as final use connected with life conditions.

of consumption responds to some cultural appeal also far away from the established patterns of the first industrial revolution. What are the justifications for increasing sumptuary consumption? Questioning development as a movement geared to eliminate poverty shall be any way to separate the goals of the rich from those of the poor.

3 THE UNBENDING TREND

The continuity of the society of capital depends on its capacity to expand. The system cannot reproduce itself in one same composition. Not in the side of capital nor in the worker's side. In the practice of modern economy there is no room for simple reproduction as the one depicted by Marx in the ideal situation of zero accumulation. One goes forward ou backward. Going forward means more resources, more work, direct and indirect and more energy. The expansion has its own rules gaining speed as the time lag between decisions and implementation shrinks and the time between technology creation and diffusion tends to be nullified. That trend appears as a curb which angle does not change. The system goes in the same way regardless of extinction of species and exhaustion of mineral resources. This essential trend is not a problem of entropy nor of the stagnant economy as seen by David Ricardo. The whole system of energy production is geared to attend to the interests of big industry in a general picture that unrolls far beyond the scope of private enterprise. However that general movement is also responsible for a cohort of environmental effects which very meaning can only be assessed through an approach of its total impact. It is always timely

The major trend in the energy field is given by a consumption that grows faster than the reserves available and is qualified by limits of substitutibility among the types of energy. Moving auto motors from cars to planes requires oil and all the other sources have a spectrum of uses that cannot be changed. This trend was determined by the growth of advanced economies in the time lap from 1946 to 1970 that placed the automotive industry as wagon leader of consumption industry. In the following years that pattern was challenged by a reduction on market expansion⁸ and finally by a growth of peripheral economies. The shape of the curve of demand is not changing and results in an increasing pressure on de sources more flexible for diversified uses. Hydroelectric power has visible limits, nuclear power carries irreversible risks and non-conventional sources, like eolic and solar, thou desirable cannot substitute massive consumption. The weight of demand falls on oil and its derivatives. Planning energy means work on the substitutibility so as to place bets on alternative combinations of sources and uses. Plain energy transitions from nowadays systems still is a part of traditional planning, up to now pinned down by the principles of engineering. New models shall have to be derived technical option to be sketched from other reading of science.

The major trend of consumption comes from the combination of a growing population of consumers and from a delay of effective technologies for reducing losses of all kinds. The affluence of China and India compare with the stagnant Europe and the slow moving economy of the United States. In South America Brazil emerges as the great consumer, buying energy from its neighbors in spite of own integrated system. It all rebounds on waste. Capitalist

⁸ One hypothesis to consider is that such slackening of the market goes along with neoliberal policies and induced unemployment. The vicious circle of unemployment continued to be pressed by policies shaped to deal with the growth of external debt. In practice it is impossible to separate this introversion of economic policies from the fact that Asian economies, especially China, became more competitive than the U.S. and most European countries. The crisis erupted in 2008 showed the big economies helping companies that had lost competitiveness e financing banks instead of helping consumers.

society is essentially a producer of waste⁹. The reason between final products and waste lie in the intermediate consumption and gives place to a coefficient of efficiency, parallel to the efficiency of work named productivity. Efficiency is not only inside the factories but there is the efficiency of individual factories and the systemic efficiency of a nation or a region. We shall see that the focus of energy planning tends to the efficiency of the system as a whole taking as incidental the gains and losses of specific industries. Planning petrochemical complexes aims to reduce losses of energy in combined production.

The whole system of energy production is geared to attend to industrial interests, in a general picture that extends far beyond the scope of private interests. However that wide movement is also responsible for a cohort of environmental effects which real meaning can only be assessed through an approach of its total impact. It is always timely to remember some remarks of Heisenberg about the axis linking the total and the specific.

Those sectoral interests entail ideology as the representation of the different class interests embedded in social activity. National viewpoint taken as representative of society must provide an equilibrium of forces that in the end mean holding back the pressures exerted by big capital through massive consumption undertakings and disregarding long term effects of resources depletion. So, it is a matter of values. In short, industry resumed the variety of behavior of trade and mining appearing as the sole modernization factor in nowadays society. Companies devoted to produce energy are moved by interests that entrails ideology as the representation of class conflict embedded in social activity. The social foundations of energy production must be rescued from the technical reductionist view that takes only electric power and dismisses the many other forms of energy for instantaneous consumption. One shall remember that even the richer countries continue using traditional sources of passive energy like timber and the waste in most industrial processing indicate immense resources that can be recovered by the means of simple technology. In any consistent questioning of energy availability waste and garbage items to be reviewed, connected to the expansion of intelligent devices like the small irrigation, windmills and biodigesters.

Political power appears through the control of industrially produced energy that functions as the mobile part of the system. The industrial production of energy has some technical indicators like a coefficient of energy in final products. The whole system operates with the inertia given by operational investments in face of innovative behavior. The connection between science and technology is at the center of this dilemma. The view oriented to technology tended to dismiss the exchange among the various technologies and the industrial path to complexity (CASTI, 1997). The option for deepening the industrial process behind each final product implies in creating a self-enlarging system. That operates more to protect the system than to gain efficiency for society. The creation of self-enlarging systems, bound by a logic of increasing costs and assuming the increase of consumption as inevitable, means fixing a financial and political power as the final decision in leading the system to unconvertible options.

The most disturbing feature of this process is the increasing need for operational energy that is accessible to

⁹ The economic meaning of waste in the advanced consumer' society was first detected by Paul Baran (1956). Working on the distinction between potential and real income he showed how squandering helps companies to finance their present expenses creating future social costs. Marx (1967) pointed out to the new industrial field based on the exploitation of scoria, in the chapter of savings of constant capital by industry. We shall distinguish the social problem of disposing of waste from the economic potencial of new industrialization of waste. Apart from the fact that the control of waste became the source of illegal business, there is a question about its impact on urban environment that remains unsolved. The question about the weight of waste in advanced capitalism also connects with the issue about idle capacity in industrial production. The role of idle as first explored by Ignacio Rangel (1961) as related to industrial production but deserves a special attention concerning energy production.

consumers. It comes differently to countries depending on stable or declining reserves or to others, like Russia and Brazil, whose reserves are growing with new findings of oil and gas. Varying reserves plus capacity to exploit project expectations on prices with collateral effects on coal industry. This presumably bound to decline stays as basic in spite of environment considerations for expectations on prices. The growth of cities has a important role on that account and Brazil had the biggest urbanization in Latin America running from some 20% of urban population in 1960 to more than 85% in 2000.

Energy market as a whole seems irrational at first sight for valuing coal once it carries the larger number of accidents and generates the bigger amount of rubbish. Price advantages are the villain on that option that yearly dozens of miners. Certainly, the plead underneath for more reserves and more efficiency poses one question on curtailing consumption of the big consumers, anticipating the final energetic eclipse. Unless a great switch from the present major sources to another cheap and abundant or an unbending trend is drawn representing the growing pressure on declining resources and the political fight over the control of the sources.

Once admitted the terms sustaining this trend the question now is to determine which policies meet the challenges put forward by the actual constraints of energy policies. The mechanical view of policy proved unable to grasp the social claims to control the resources loss. Energy planning is mandatory but some evaluation of power undeclared goals embedded in planning, especially in Latin America, is a necessary step to reform energy policies (KAPLAN, 1985).

4 THE STRATEGIC FRAMEWORK

Under present circumstances Brazil shall not be able to avoid the political implications of its own size therefore dealing with the complexity of a continental role and an worldwide presence. The alliances made under the cover of its previous play as exporter of few raw materials ceased to attend to the country's needs. Aside from a prudent alliance with the United States a careful combination of agreements and partnerships with more advanced countries paved the way for a deep renewal of long-term connections. That helped to dilute the business concentration and opened new paths for international relationships. There comes a new strategic framework that not necessarily passes by a requested seat in the Security Council of the United Nations but is enough to stall any potential threat from NATO. As Brazil develops a new role as export player it certainly has to devise an adequate defense of its own resources. That calls for an actualized evaluation of its resources deriving priorities and indicating lines of action. It's a job for an active State bearer of modernization, the solely institution capable of operating the transmission among the various segments of infant industry society (MOTA, 2011).

As the State became the demiurge of national development the ideology of economic and social development established a new role for the Active State replacing the Welfare State. Not only to provide welfare for the poor but responsible for technology and strategic investment beyond the strategic guidelines. Such was the State blank of liberalism since the 80's while also demanded for care of environment and civil rights. Since than its major functions are being quietly restored as the traditional rich countries remain in the morass of depression.

Energy planning is at the center of strategy seeing that transitions in the system of energy production has to deal with unstable combinations of renewable and non renewable resources along with some State policy for science and technology. In such conditions energy is not just another merchandise less a commodity. It is an strategic resource that ought to be protected from greed and immediacy. The strategic viewpoint values energy as the only input present in all inter-industry relationships.

5 FINAL REMARKS

Planning energy in its real sense means handling technology and life conditions on scientific basis quite afar from to-day business requirements. It is futile to think that it can be achieved solely with the immediate technical references separated from a constant scientific guidance. The same request to restore the scientific realm of Geology applies to the whole energy operation. That goes to epistemology. The double epistemic obstacle required by Gaston Bachelard as an unavoidable scientific procedure seems to be a necessary step in the way to secure scientific quality on energy policy (1978). Bachelard's request for a critical racionalism complies with scientific consistency extending to the scientific quality of technology¹⁰. As the world of energy depends more on high technology the scientific side identifies with the capacity to innovate.

A corresponding emphasis shall be put on the political side of the question. From a synthetic but actual appraisal it can be said that the political profile of technical problem underlies the immediate decisions and imposes realism even on the small undertakings. Cross-references and structural view of industry is essential to work on the design of new options for production and consumption¹¹. The overall approach is national with international restrictions.

The major differences between the interests of big capital and society became clear, as the big enterprise needs big undertakings to reproduce its capital. Energy programs are very much like that. The expansion of the total use of energy – we shall mistake as consumption - opened opportunities especially because it comes with a new geography of power (HARVEY, 2011). Energy is a most privileged field in which investments tend to be secure and profitable. Energy production has the biggest indirect effect on industry developing at the base of inter-industry relationships. Financing energy production became a strategic issue. The recent wars have been clearly matter of control over oil and gas though the results so far do not comply with the interests and the speech of the warmongers. The political core of the question is self-explaining. Energy policies are historically placed and former colonial practices are being rejected like happened recently with Argentina.

This all show that Identifying global trends is as important as developing applied measures in energy planning, first because it allows to measure the restrictions ahead and second it indicates where to concentrate efforts to prevent bottlenecks. The sense of totality is overwhelming when the issue is to define short-term policies compatible on the long run. Avoiding bottlenecks leads to some patchwork policies, but that successive displacement of restrictions encompass the view of long-term movements. Clearly, it is a matter of global planning in its traditional sense. It is a clear hint to the fact that energy planning is something to deal with through multidisciplinary means, combining various scales of time and

¹⁰ The way of Bachelard implies on carrying the scientific manner to the practical field as seen in his chapter "dualism of rationalism in electricity and in mechanics"(1977, p. 222)

¹¹ Reference shall be made to the milestone work of Hollis Chenery, Structural Change and Development Policy (1979) that should be chosen as a guide on the stile of work here indicated.

taking into account the spatial dimension. The same as war it is too important to be left to technicians.

Growing international tensions around the future of oil supply, passing the skirmishes among sellers and buyers indicates that it would not be wise to limit the energy planning issue to technical and engineering prospects overlooking science commandments. International policy requires a great deal of professionalism. One tends to be attracted by the movements of the big consumer nations that in fact presume they have rights on other nations resources, forgetting our own power equation. Meanwhile the restraining power of producers encounter continental strategies that work on lines of transportation and areas of influence (SÉBILLE-LOPEZ, 2006) with China emerging as a dominant presence in Asia an expanding in Africa.

Energy planning becomes one of the many victims of an uncritical education that favors conservatism in handling theoretical progress. The plea for renewable energy sources identified with environmentalism made it possible to overlook the weight of deep scientific approach. That draws a line between a “new” invention of modern science like the one proposed by Stengers (2004) and a science submitted to technology in the kind of the justified by Stokes (2005). The possibilities of consistent scientific analysis shall be traced back to the epistemological context linking scientific knowledge to analytical capacity (Pedrão, 1996). Scientific consistency must be accepted as necessary as the interventions on energy production system induce compromise with research policy that changes present and future costs of production. A creative energy policy must be freed from immediate military purposes and linked to an equally creative science that drifts away from pragmatism. Social trust reveals as mandatory for policies intending to face that crucial trend to energy blockade. An invitation shall be made to take this issue as one central for a Critical Political Science.

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